Parent-Child Bargaining, Parental Transfers and the Postsecondary Education Decision

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I. Introduction

Models used throughout the human capital literature to examine the educational and earnings outcomes achieved by children are by and large unitary preference in nature, with either parents making all of the investment decisions for their child or the child making all of the investment decisions for himself, given some level of parental resources. The importance of these human capital investments lies in the fact that they are major determinants of the child's future earnings, and hence, his consumption. These models, however, ignore or assume away the process by which parents and children resolve any disagreements.

Disagreements between a parent and child may arise over whether or not the child should attend college, how much effort the child should expend if college is indeed chosen, and how the financial cost of such an undertaking would be split between them. Parents may disregard their child's effort disutility, parents and child may have different rates of time preference, and/or the child may lack concern over his parents' consumption.

Sometimes, ignoring such disagreement may be appropriate. When children are very young, they must rely completely on their parents for financial support. Hence, even if they disagree with their parents, their parents are likely to have all of the bargaining power, and a model in which parents make all decisions is appropriate. On the other hand, when children are grown up and financially independent from their parents, they have all of the bargaining power. In this case, a model in which the adult child makes all of the decisions is appropriate. However, for college-age children, the

disposition of bargaining power is less clear, and in this case it becomes important how disagreements between parents and children are resolved.

This paper addresses parent-child disagreement over the level and parental financing of postsecondary education by introducing less than perfectly altruistic parents and parent-child bargaining to the postsecondary education decision. A cooperative bargaining model is formulated in which parents' consumption, their child's consumption, and the child's level of postsecondary schooling are explicit choice variables and the level of parent-to-child transfers is an implicit choice variable. The implications of this bargaining model for the level of postsecondary schooling and the dollar value of parental transfers are then compared to those of the corresponding unitary preference model.

These comparisons lead to several testable hypotheses. First, the unitary preference model implies that only pooled income enters the demand function for schooling, while the bargaining model allows parents' and child's incomes to enter separately. Thus, empirical evidence showing that parents' and child's incomes have different effects on the level of schooling would reject the unitary preference model but be consistent with the bargaining model. Second, assuming schooling is a normal good, the unitary preference model predicts a positive effect of income on the level of schooling while the bargaining model allows negative income effects. For example, if parents want less schooling for their child than their child wants for himself, parents may exert their bargaining power so that less schooling is obtained than the child wants. This may result in a negative coefficient on parents' income. On the other hand, if the child wants less schooling than his parents want for him, the child may exert his bargaining power so that

less schooling is obtained than the parent wants. In this case, the child's income coefficient may be negative. Thus, empirical evidence showing that either the parents' or child's income coefficient is negative would reject the unitary preference model but would be consistent with the bargaining model. Third, according to the unitary preference model, a one-dollar increase in child's income along with a simultaneous one-dollar decrease in parents' income reduces the level of parent-to-child transfers by one dollar. The bargaining model, however, allows for both a reduction in transfers of less than one dollar as well as an increase in transfers. Therefore, empirical evidence showing something other than a one-dollar reduction in transfers would be a rejection of the unitary preference model but would be consistent with the bargaining model.

It is important to note that these testable hypotheses are valid only for cooperating families, those families in which parents make a transfer. Therefore, reduced form equations for transfers and the level of postsecondary schooling are estimated on the subsample of students that receive parental transfers. Because these equations are estimated using a selected sample –transfers are observed if and only if the child is receiving a transfer and whether or not a transfer is received is observed only if the child is enrolled in a postsecondary institution- a two-stage double-selectivity correction procedure is performed. Predicted variables are used to address the potential endogeneity of three right hand side variables, including the price of schooling, scholarship/grant amount received, and the child's income.

The data used to test these hypotheses are restricted-use student-level data from the High School and Beyond Surveys conducted for the National Center for Education Statistics (NCES), U.S. Department of Education, by the National Opinion Research

Council (NORC). Respondents to this survey were high school sophomores in 1980 and were re-interviewed in 1982, 1984, 1986, and 1992. Of the sample of 4,281 respondents who participated in all three of the 1982, 1984, and 1992 surveys and had non-missing information, over 38 percent reported disagreement with their parents over the level of schooling the student should complete. Of these students, 75% expected to complete less schooling than their parents desired, while 25% expected to complete more. Because the bargaining model predicts different things depending on whether parents want more, child wants more, or there is no disagreement over the level of schooling, the results will are disaggregated by disagreement status.

The paper proceeds as follows. Section II overviews the related schooling and transfer literatures. Section III presents both the unitary preference and bargaining models and compares and contrasts their implications. Section IV presents the data and discusses the construction and relevance of key variables. Section V presents the econometric model and the hypotheses to be tested. Section VI presents and interprets the main empirical results as well as results from several sensitivity analyses. Section VII concludes with an overall interpretation of the results and directions for future research.

II. Literature Review

Models used throughout the human capital literature to examine the educational and earnings outcomes achieved by children are of one of two types. Models of the first type assume that parents have control over all family investment decisions. In these models children's earnings are determined entirely by their initial endowment, their parents' investments, and their "market luck". Examples of such models include those of

Becker and Tomes (1976, 1979, 1986) and Becker (1981, 1993). A major characteristic of these models is that they abstract from any sort of investment the child will eventually make in himself, relying on the assumptions of parental altruism and Becker's Rotten Kid Theorem (Becker 1974) to assume away any parent-child conflict.

The Rotten Kid Theorem states that even a completely selfish child will act to maximize family income, given an altruistic parent. However, the theorem has been rejected as holding only under very restrictive and unlikely conditions. An early criticism by Hirshleifer (1977) notes that in order to achieve desired behavior, parents must make their transfer after their child acts. Later criticisms by Bergstrom (1989) and Bernheim, Shleifer, and Summers (1985) point out that the Rotten Kid Theorem may not hold if utility depends on non-transferable commodities, such as effort. Finally, Bruce and Waldman (1990) show that the Rotten Kid's Theorem may not hold in a two-period setting with savings.

There is something more fundamental at issue, however. The Rotten Kid Theorem derives from the assumption that parents are altruistic in the sense that they completely accept their children's preferences. With regard to the postsecondary decision, however, this is probably not the case. A more realistic assumption is that parents may have paternalistic preferences as described by Pollak (1988). With paternalistic preferences, the child's utility may enter the parents' utility function, but parents may also have direct and conflicting preferences over goods, such as schooling, over which the child also has direct preferences. For example, parents may want their child to attend their college alma mater even though their child would rather attend a different school that all of his friends are attending. Or, parents may feel their children

are too myopic when it comes to their education decisions. Alternatively, a child may want to go to college even though his parents would prefer him to work in the family business.

In contrast to this parent-as-decision-maker type of model, the second type of human capital model focuses on the young adult's own investment decisions (e.g. whether or not to attend college), given some pre-existing endowment determined both by inherent ability and previous investments by parents. Such a sequential parent-then-child investment approach has led to numerous regressions of schooling variables on family background, neighborhood and peer characteristics. Haveman and Wolfe (1994, 1995) provide an excellent survey of much of this literature.

Neither the parent-as-decision-maker or child-as-decision-maker models allow for disagreement between a parent and child to affect educational decisions.[1] The general transfer literature, however, has not ignored such parent-child conflict. In the transfer literature, parents are often assumed to be less than perfectly altruistic and children's concerns often directly conflict with their parents'. In these models, transfers are utilized as a strategic device by parents to regulate their child's behavior. For example, in Bernheim, Shleifer, and Summers (1985), parents must provide strategic bequests to their adult children to induce them to visit more often than they otherwise would. In Pollak (1988), parents provide strategic transfers to their children to increase their consumption of particular merit goods. More recently, Jao, Hotz, and Jin (2000) formulate a bargaining model in which parents provide strategic transfers to their children to deter them from taking an action, in this case having a teen birth, that they deem undesirable.

[1] There are several studies that allow disagreement *between parents* to affect their children's human capital. For example, see Thomas (1994).

Many empirical analyses in the transfer literature have attempted to determine whether the data are more consistent with the "altruistic parents" models or with those in which parents are not so altruistic (Menchik 1980; Wilhelm 1996; Bernheim, Shleifer, and Summers 1985; Cox and Rank 1992; Altonji, Hayashi, and Kotlikoff 1997; and McGarry and Schoeni 1995). Such evidence is mixed, however, because the studies differ widely across choice variables, age groups, whether or not in-kind transfers are considered, and whether the transfers considered are bequests or inter-vivos transfers. Looking at bequests made by parents to multiple children, Menchik (1980) finds that equal sharing among children is the rule, rather than the exception, a result which does not support the altruism model put forth by Becker and Tomes (1976). Wilhelm (1996) tests a more general model of parental altruism that is consistent with the extensive amount of equal division in the data, yet still rejects parental altruism. Bernheim, Shleifer, and Summers (1985), who also look at bequests, find that bequests are often used as compensation for services provided by beneficiaries, evidence inconsistent with the altruism model. Cox and Rank (1992) and Altonji, Hayashi, and Kotlikoff (1997) focus on inter-vivos transfers rather than bequests and also obtain results that are more consistent with exchange models than with altruistic models. However, McGarry and Schoeni (1995) also analyze inter-vivos transfers but cannot reject the altruism model.

The theoretical model in the next section makes a contribution to the human capital literature by allowing parents and child to make a cooperative simultaneous decision over the postsecondary decision, addressing the disjoint between the parents-as-decision-maker and child-as-decision-maker models. The model contributes to the

transfer literature by studying inter-vivos transfers and providing a test of parental altruism in the context of the postsecondary education decision.

III. Theoretical Models

Unitary Preference Model

The basic unitary preference model assumes a single decision-maker household with utility function given by $W(c^p, c^c, s)$, where c^p, c^c, and s are, respectively, the parents' consumption, the child's consumption, and the child's level of schooling, and $W(\cdot)$ is the parents' utility function.[2] [3] The household's budget constraint is given by

$$c^p \cdot p_p + c^c \cdot p_c + s \cdot p_s = M_p + M_c \qquad (1)$$

where p_p, p_c, and p_s are the respective prices of parents' consumption, child's consumption, and schooling, M_p is the parents' exogenous income, and M_c is the child's exogenous income. Note that by assuming that the price of schooling and child's income are exogenous, I am abstracting from school quality and labor-leisure-schooling choices, although I will address the potential endogeneity of these variables in the empirical analysis. Maximizing the household utility function, W, subject to (1) yields the following demand functions:

$$c_u^{p*} = c_u^{p}(p_p, p_c, p_s, M_p + M_c) \qquad (2a)$$

$$c_u^{c*} = c_u^{c}(p_p, p_c, p_s, M_p + M_c) \qquad (2b)$$

$$s_u^{*} = s_u(p_p, p_c, p_s, M_p + M_c) \qquad (2c)$$

[2] This utility function nests a more restricted specification, $W(c^p, U^c(c^c, s))$, which would explicitly allow the child's preferences to enter the parents' utility function.

[3] A child-as-decision-maker unitary preference model in which the child is independent and selfish would ignore parents' consumption, c^p, and treat parental transfers as an exogenous source of income. The parent-as-decision-maker unitary preference model is discussed here because it treats transfers as endogenous, facilitating comparisons between the unitary preference and the bargaining framework.

where * indicates solution values, the u subscript refers to the unitary preference model (to distinguish these demand functions from the bargained demand functions to be described next), and μ is the Lagrange multiplier. Note that only pooled income, $M_p + M_c$, enters these demand functions. This is the unitary preference model's pooled income hypothesis, and can also be written in terms of the following comparative statics:

$$\partial c_u^{\,p}*/\partial M_p = \partial c_u^{\,p}*/\partial M_c \qquad (3a)$$

$$\partial c_u^{\,c}*/\partial M_p = \partial c_u^{\,c}*/\partial M_c \qquad (3b)$$

$$\partial s_u*/\partial M_p = \partial s_u*/\partial M_c \qquad (3c)$$

Another interesting implication of the unitary preference model relates to transfers. Let t_u* be the amount of transfers parents make to their child, where $t_u* = M_p - c_u^{\,p}* \cdot p_p$. Taking partial derivatives with respect to M_p and M_c we have $\partial t_u*/\partial M_p = 1 - p_p(\partial c_u^{\,p}*/\partial M_p)$ and $\partial t_u*/\partial M_c = - p_p(\partial c_u^{\,p}*/\partial M_c)$. Subtracting $\partial t_u*/\partial M_p$ from $\partial t_u*/\partial M_c$ and substituting from (3a), the implication of the unitary preference model with respect to transfers is:

$$\partial t_u*/\partial M_c - \partial t_u*/\partial M_p = -1, \qquad (4)$$

indicating that a one dollar increase in child's income accompanied by a simultaneous decrease in parents' income by one dollar results in a reduction in parental transfers of one dollar.

Bargaining Model

The simple bargaining model of household decision-making that I present here is a direct adaptation of McElroy and Horney's (1981) husband-wife bargaining model of

consumption and labor supply decisions to a situation in which parents and child bargain over consumption and schooling decisions. The model requires several assumptions:

Assumption 1: *A household consists of two decision-makers. Parents present a united front and thus act as one decision-maker. Their child acts as the other.*

Assumption 2: *Parents and child choose either to make their decisions independently and without regard for each other (the non-cooperative state) or to participate in cooperative bargaining with each other, thus making joint decisions (the cooperative state).*

Assumption 3: *In the non-cooperative state, parents and child care only about themselves.*

In the non-cooperative state, because parents care only about themselves and there is no saving, parents spend all of their income on themselves (Formally, parents choose c^p to maximize $U^p(c^p)$ subject to $c^p \cdot p_p = M_p$). Thus, the non-cooperative state is characterized by parents making no transfers to their children. The resulting indirect utility function is given by $V^p(p_p, M_p)$, and is the maximum utility the parents can attain in the absence of cooperation. Because this is the best the parents can do if they do not cooperate with their child, this is their threat point.

Simultaneously, yet independently, the child chooses c^c and s to maximize $U^c(c^c, s)$, subject to his budget constraint, $c^c \cdot p_c + s \cdot p_s = M_c$. The indirect utility resulting from this maximization is given by $V^c(p_c, p_s, M_c)$, and is the maximum utility the child can attain in the absence of cooperation. As such, $V^c(p_c, p_s, M_c)$ is the child's threat point.

Assumption 4: *In the cooperative state, the parent cares about the child's consumption and schooling, but the child is selfish and cares only about himself.*

The child's cooperative state utility function is no different from his non-cooperative state utility function, $U^c(c^c, s)$. That is, even in the cooperative state the child is selfish in that he does not care about his parents' consumption. However, the parents' cooperative state utility function, given by $U^p(c^p, c^c, s)$, does differ from theirs in the non-cooperative state as they now care about (i.e. feel responsible for) their child's consumption and schooling.

Assumption 5: *The Nash bargaining solution is obtained as the result of bargaining between the parents and their child.*

To obtain the Nash bargaining solution, the cooperative state utility functions and the parents' and child's threat points described above are combined into the following cooperative state "family" utility function:

$$N = [U^p(c^p, c^c, s) - V^p(p_p, M_p)][\, U^c(c^c, s) - V^c(p_c, p_s, M_c)], \quad (5)$$

where N denotes the Nash product function. This Nash product function has been called the utility-gain product function (McElroy and Horney, 1981) because the first term, $[U^p - V^p]$, is the parents' gain from cooperation (the difference in the parents' utility between the cooperative and non-cooperative states), and the second term, $[U^c - V^c]$, is the child's gain from cooperation.

The cooperative Nash bargaining solution is used because it is "intended to treat situations involving two individuals whose interests are neither completely opposed nor completely coincident. The two individuals are supposed to be able to discuss this situation and agree on a rational joint plan of action, whereas in a non-cooperative model

it is impossible for the players to communicate or collaborate in any way (Nash 1953)." Thus the cooperative approach seems to be more appropriate for family decision-making.

Maximizing (5) subject to the household budget constraint given in (1) yields the following bargained demand functions for consumption and schooling:

$$c_b^{p*} = c_b^{p}(p_p, p_c, p_s, M_p, M_c) \qquad (6a)$$

$$c_b^{c*} = c_b(p_p, p_c, p_s, M_p, M_c) \qquad (6b)$$

$$s_b^{*} = s_b(p_p, p_c, p_s, M_p, M_c) \qquad (6c)$$

where the subscript b refers to the bargaining model. Note that in this model M_p and M_c enter separately into the above demand functions. This is a rejection of the income pooling hypothesis of the unitary preference model, and can be written in terms of the following comparative statics:

$$\partial c_b^{p*}/\partial M_p \gtrless \partial c_b^{p*}/\partial M_c \qquad (7a)$$

$$\partial c_b^{c*}/\partial M_p \gtrless \partial c_b^{c*}/\partial M_c \qquad (7b)$$

$$\partial s_b^{*}/\partial M_p \gtrless \partial s_b^{*}/\partial M_c \qquad (7c)$$

Another interesting implication of this bargaining model relates to transfers. Note that $t_b^* = M_p - c_b^{p*} \cdot p_p$ and that, taking partial derivatives with respect to M_p and M_c, we have $\partial t_b^*/\partial M_p = 1 - p_p(\partial c_b^{p*}/\partial M_p)$ and $\partial t_b^*/\partial M_c = - p_p(\partial c_b^{p*}/\partial M_c)$. Subtracting $\partial t_b^*/\partial M_p$ from $\partial t_b^*/\partial M_c$ and substituting from (7a), the implication of the bargaining model with respect to transfers is:

$$\partial t_b^*/\partial M_c - \partial t_b^*/\partial M_p = -1 + p_p\,(\partial c_b^{p*}/\partial M_p - \partial c_b^{p*}/\partial M_c) \gtrless -1. \qquad (8)$$

In words, this means that a one dollar increase in child's income and a simultaneous decrease in parents' income by one dollar does not necessarily result in a reduction of transfers of one dollar, and thus rejects the altruism assumption of the unitary preference model. In fact, if $(\partial c_b^p*/\partial M_p - \partial c_b^p*/\partial M_c) > 0$ (parents' income has a greater effect on parents' consumption than their child's income does), then $\partial t_b*/\partial M_c - \partial t_b*/\partial M_p > -1$. That is, there is a reduction in transfers by less than one dollar or possibly even an increase in transfers.

Finally, even though schooling is assumed to be a normal good, the bargaining model allows for negative income effects on the level of postsecondary schooling, while the unitary preference model does not. In the bargaining model, if parents want less schooling for their child than their child wants for himself, parents may exert their bargaining power so that less schooling is obtained than the child wants, possibly resulting in a negative coefficient on parents' income. On the other hand, if the child wants less schooling than his parents want for him, the child may exert his bargaining power so that less schooling is obtained than the parent wants. In this case, the child's income coefficient may be negative. Thus, empirical evidence showing that either the parents' or child's income coefficient is negative would reject the unitary preference model but would be consistent with the bargaining model.

IV. Data

Comparisons between the unitary preference and bargaining models lead to several testable hypotheses. First, a one-dollar increase in parents' income has the same effect on the child's level of schooling as a one-dollar increase in the child's income.

Second, an increase in the child's income by one dollar, accompanied by a simultaneous decrease in parents' income by one dollar, leads to a reduction in parent-to-child transfers by one dollar. Third, assuming schooling is a normal good, parents' and child's income coefficients are positive. Rejection of any of these hypotheses is a rejection of the unitary preference model and provides evidence consistent with the bargaining model.

To test these hypotheses two alternative level of postsecondary schooling equations and a transfer equation will be estimated on the sample of cooperating students (those who are receiving parental transfers and hence are attending postsecondary school). To provide insight into how income coefficients differ according to the type of parent-child conflict, these equations will also be estimated on three subsets of this sample that are defined by disagreement status: parents want more, child wants more, and no disagreement.

Several auxiliary equations will also be estimated to correct for potential endogeneity bias and selectivity bias. First, an enrollment probit will be estimated to correct for selection in the observation of the price of schooling and the amount of scholarship and grant money received. Then, predicting equations for the price of schooling, scholarship/grant amount, and child's income, all of which are potentially endogenous, will be estimated. Finally, a bivariate probit consisting of an enrollment probit and a transfer receipt probit will be estimated to correct for two potential sources of sample selection bias.

The High School and Beyond Surveys (HS&B), administered by the Department of Education's National Center for Education Statistics, provide the data for the analysis. The base year survey was conducted in 1980 for both high school sophomores and

seniors. Follow-up surveys for both the sophomore and senior cohorts were conducted in 1982, 1984, and 1986, and an additional follow-up for the sophomore cohort was conducted in 1992. Although follow-ups did not occur every year, retrospective questions were asked in each of the follow-up years in order to fill in information relevant to non-survey years. To supplement the survey data, postsecondary education transcripts for the sophomore cohort were collected and coded in 1986/87 and 1993. My analysis will focus on the sophomore cohort only in order to take advantage of this transcript information.

The HS&B sophomore database contains 14,825 students, although the number of student observations actually used in this analysis is substantially less. First, respondents who did not participate in all three surveys were dropped from the analysis, leaving 12,423 respondents. An additional 6,785 respondents were dropped because they were missing information on at least one key variable. Finally, an additional 623 respondents were dropped because they were either the only respondent from a specific high school with non-missing information or, if there were more than one student from that high school with non-missing information, there was no variation among these students in terms of their postsecondary enrollment status, leaving 5,015 student observations. Such within-school variation is necessary in order to use school dummies as instruments in the predicting equations. To address any potential concerns about the representativeness of this reduced sample, Appendix Table A1 gives the means of variables that can be measured for all students in the database. While the means of several of these variables are statistically different between the full sample and the analysis sample, the differences

are small, suggesting that the subsample with usable data may not be too different from the full sample.

The dependent variable used in the transfer regression is the dollar value of parental transfers made during the 1982-83 academic year. This variable includes not only cash transfers made directly to the student but also tuition and fees, room and board, and other schooling-related expenses paid by the parent on the child's behalf. Unfortunately, parental transfers are observed only for those students who reported attending postsecondary school during the year, even though it is likely that some children who did not attend postsecondary school in that year did indeed receive transfers from their parents. This potential source of sample selection bias will be addressed in the empirical analysis.

Two alternative level of schooling variables will be used as dependent variables in the schooling regressions: years of postsecondary schooling and initial program choice. Both these variables are defined given that some postsecondary schooling is undertaken. Information on enrollment status (enrolled versus not enrolled, full-time versus part-time, 2-year versus 4-year) is provided in the HS&B database for every month during the ten-year period from June 1982 through June 1992, and is based both on survey responses and transcript information. To construct years of postsecondary schooling from these monthly data I treated a month of part-time enrollment as ½ month, a month of full-time enrollment as 1 month, and a month of non-enrollment as 0 months, summed over all months, and then divided by twelve. The strength of this variable is that it reports actual postsecondary education attained by the student, rather than just the initial program attended by the child. Thus, if the child started out at a two-year community college but

had every intention of transferring to a four-year program, this would be captured by the years of postsecondary schooling variable. However, because the theoretical model on which the hypothesis tests are based considers only an initial single-period decision, one must assume that all postsecondary education is decided at one point in time. In addition, in order to construct the years of postsecondary schooling variable, only those respondents with complete postsecondary transcript information could be included, resulting in a smaller sample size than could be had with the alternative level of schooling variable, initial program choice.

The initial program choice variable is a dichotomous dependent variable that takes a value of 1 if the child was enrolled in a 4-year postsecondary program in October of 1982 (the fall semester following the typical cohort member's high school graduation) and a value of 0 if the child was enrolled in a 2-year program. The strength of this variable lies in the fact that it is a single period measure and therefore more consistent with the single period decision embodied in the theoretical model than the years of postsecondary schooling variable. Weaknesses of this variable, however, are that it does not include individuals enrolled in 1- or 3-year vocational schools and that it does not address intentional progression from a 2-year to a 4-year program.

A key explanatory variable is parents' income. However, because categorical family income rather than parents' income is reported in the HS&B database, parents' income needed to be constructed. As a first pass, I constructed a parents' income variable by subtracting the child's reported income from the midpoint of the reported family income range for all income categories except the top income category, "$50,000 and over". As no midpoint was available for this category, I instead subtracted child's

reported income from an estimate of average family income that was calculated using non-topcoded income data from the 1983 March Supplement to the Current Population Survey (CPS). Because this is an ad hoc way of constructing the parents' income variable, however, this variable will only be used to test the sensitivity of the results.

The parents' income variable that is used in the main empirical analysis was also constructed from both the internal CPS and the HS&B data, although in a more statistically valid way. To construct this variable, I first selected a subsample from the CPS to match the characteristics of my HS&B sample. This subsample included persons aged 17-19 who were children of an interviewed head of household. For these children I then constructed several variables expected to be correlated with parents' income to match those available in the HS&B data. These included family income category dummies, parents' highest education dummies, state dummies, an urban dummy, a dummy indicating whether the family was a traditional family during the child's senior year (the child lived with both his mother and father), the number of siblings, and the child's wage and salary income. I then regressed parents' income on these variables using ordinary least squares (OLS). The regression results are reported in the appendix Table A2. Applying these CPS regression coefficients to the matching variables in the HS&B data and adding a random term, I was then able to predict parents' income. The major strength of this parent's income variable over the first is that more information than just the family income category is used in its prediction. It's main weakness, however, is that it is predicted rather than observed.

Child's income is another key explanatory variable. It was constructed from the child's survey responses to questions about income he/she received from various sources

in 1982, and includes all earnings and nonlabor income except gifts from relatives and scholarships and grants received. Gifts from relatives were excluded because gifts from parents and gifts from other relatives could not be distinguished. Scholarships and grants were also not included in the child's income; they are instead treated as a (negative) price variable in the analysis. If the child has a spouse, the spouse's income is included. The strength of this variable is that it includes income available to the child from all sources (including a spouse, if one is present) and thus gives a complete picture of the child's bargaining position.

An alternative child's income variable was constructed by taking the simple average of the child's 1982 and 1983 incomes. This was done because, while the decision regarding postsecondary education was probably made in 1982 before the child graduated from high school, the academic period over which many of the other variables are measured is the 1982-83 academic year. I will show that the results are not sensitive to the particular measure of child's income.

Other economic explanatory variables that enter as arguments of the schooling demand function and transfer equation include the price of schooling and the amount of scholarships and grants received. The price of schooling is given by the tuition and fees charged to the student by his postsecondary institution for the 1982-83 academic year, regardless of the source of payment. The scholarship/grant variable is the total amount of scholarships and grants received for that academic year. A disadvantage of both these variables is that they are reported only for those students attending postsecondary school. However, potential sample selection bias is addressed in the empirical modeling section.

Key personal background variables include the child's standardized test score and high school GPA, gender and race dummies, the overall number of siblings and the number of older siblings (both topcoded at six siblings), a traditional family dummy, the number of rooms in the family home (topcoded at ten rooms), and dummies for the parents' highest level of education, all of which are commonly included in some form in other analyses of children's outcomes. Both the standardized test score and high school GPA are included to control for the child's ability. The gender dummy takes on a value of 1 if the child is male and 0 if the child is female. The number of siblings is included in order to control for a major source of parental expenditure (other children) that is not directly addressed by the theoretical model. The number of older siblings is included in response to previous studies that indicate that birth order does matter when it comes to children's outcomes. The traditional family dummy is included to control for early parental "investments" in family stability that have been shown to affect children's outcomes. The parents' education dummies, intended to capture parental preferences toward postsecondary education, indicate the highest level of educational attainment achieved between the child's parents, where the missing category is less than high school. Finally, the number of rooms in the home is included to capture preferences for consumption and/or parental assets.

Additional variables that do not enter the main regressions but enter as the dependent variables in the bivariate probit used to correct for double selection include a transfer receipt dummy and an enrollment dummy. The receipt dummy takes on a value of 1 if the child received a transfer from his parents during the 1982-83 academic year and a value of 0 if he did not. The enrollment dummy takes on a value of 1 if the child is

enrolled in postsecondary school during that year and a value of 0 if he is not enrolled. Unfortunately, the receipt dummy is only observed if the child reports attending postsecondary school during the 1982-83 academic year. Therefore, a conditional bivariate probit will be estimated to address this, with the receipt probit estimated conditional on the enrollment probit. One final variable, the percent of the child's high school's 1978-79 class that is in college in 1980, is used to identify the conditional bivariate probit model. It is intended to measure the "supply" of postsecondary education, i.e. the likelihood of being accepted into a postsecondary institution.

Recall that if parents want less schooling for their child than their child wants for himself, it is possible within the bargaining framework for parents' income to have a negative effect on the child's level of postsecondary schooling. Alternatively, if the child wants less schooling, child's income may have a negative effect. Variables used to subset the sample by disagreement status include the level of schooling the child expects to attain and the level of schooling he believes his parents want him to attain. There are three subsamples: parents want more, parents want less, and no disagreement. Note, however, that the child is reporting how much he expects to attain, which does not necessarily reveal how much he wishes to attain. Therefore, if the child expects to attain more or less than he would wish given that he expects to compromise, then subsetting the sample based on these survey responses may be biased against including a student in one of the disagreement subsamples.

Sample statistics for all of the key analysis variables, including predicted variables, are given in Appendix Table A3.

V. Econometric Model

To test the hypotheses presented in section III, the following reduced form equations are estimated:

$$t = X\beta_1 + \sigma_1 e_1 \qquad (9)$$

$$s = X\beta_2 + \sigma_2 e_2, \qquad (10)$$

where t is the level of parental transfers, s is the level of postsecondary schooling, X is a vector of explanatory variables that includes the price and income variables implied by (6a)-(6c) as well as demographic characteristics to control for preferences, β_1 and β_2 are vectors of coefficients, σ_1 and σ_2 are unknown scale parameters, and $e_i \sim N(0,1)$, i = 1, 2. As both t and s are chosen simultaneously, e_1 and e_2 are likely correlated. However, equations (9) and (10) will be estimated separately using single-equation estimation techniques.

Assuming e_1 is uncorrelated with X, equation (9) could be estimated using OLS, with the estimated coefficients on parents' and child's incomes used to test the unitary preference model's altruism hypothesis (4) against the alternative hypothesis (8) derived for the bargaining model. When the continuous years of schooling variable is used to measure of the level of schooling, equation (10) could likewise be estimated using OLS to test the income pooling hypothesis (3c) against the bargaining alternative (7c). However, when the dichotomous initial program choice variable is used and a linear probability model is estimated, the standard errors must be corrected for heteroscedasticity.

OLS estimates of β_1 and β_2 are likely to be biased, however, if the error terms in (9) and (10) are correlated with X. One reason for concern is that, although the

theoretical model treats the price of schooling and child's income as exogenous, these variables are in reality potentially endogenous. The price of schooling (and the amount of scholarships and grants) may vary with the type, quality, or the level of schooling chosen. And, although I've abstracted from the child's labor-leisure-schooling decision in the theoretical model, if market work or leisure compete with schooling for the child's time, the child's income may also be endogenous. To address all of these endogeneity issues I use predicted variables in place of these potentially endogenous right-hand-side variables.

A second reason OLS coefficient estimates may be biased is that (9) and (10) are estimated using a selected sample. This selection comes from two sources. First, the demand functions in (6a)-(6c) are valid only for those families in which the parents make a positive transfer. This is because, from equation (5), parents and child cooperate if and only if $(U^p-V^p)(U^c-V^c) > 0$ and, because the child is selfish (parents' consumption does not enter into the term representing the child's gain from cooperation), cooperation is equivalent to parents making a positive transfer. Let t* be a latent variable measuring the benefits from making a transfer. Because t* depends on U^p, V^p, U^c, and V^c, all of which depend on X, a transfer receipt selection equation can be written:

$$t^* = X\theta_1 + v_1, \qquad (11)$$

where θ_1 is a vector of coefficients and $v_1 \sim N(0,1)$. Note that t* is unobserved. However, if the benefits from making a transfer are positive ($t^* > 0$), then a transfer is made. Let T be an observed indicator equal to 1 if $t^* > 0$ and equal to zero otherwise.

The second source of selection is due to the observation of transfer receipt only for children attending postsecondary school. Let s* be a latent variable measuring the

benefits from attending postsecondary school. Because the level of postsecondary schooling is a choice variable in the model, s* must depend on the same variables X that enter the right hand side of the schooling equation (10). Therefore, a postsecondary enrollment selection equation can be written:

$$s^* = Z\theta_2 + v_2, \qquad (12)$$

where Z is a vector of explanatory variables that includes X plus one additional variable necessary for identification (to be discussed in the next section), θ_2 is a vector of coefficients, $v_2 \sim N(0,1)$ and $\text{corr}(v_1, v_2) = \rho$. Although s* is unobserved, if $s^* > 0$ then the child's enrollment is observed. Therefore, let S be an observed indicator equal to 1 if $s^* > 0$ and equal to zero otherwise.

An observation is thus a member of the select sample if T = 1 and S = 1. The regression function for the transfer equation (9) for this subsample may be written as

$$E(t \mid X, \psi) = X\beta_1 + \sigma_1 E(e_1 \mid X, \psi) \qquad (13)$$

where ψ denotes the joint outcome of the two selection rules given by (11) and (12). A similar regression function can be written for equation (10). Following Tunali (1986), (13) can be rewritten

$$E(t \mid X, \psi) = X\beta_1 + \alpha_1\lambda_1 + \alpha_2\lambda_2 + \sigma_1 w_1 \qquad (14)$$

where α_1 and α_2 are regression coefficients, $w_1 = e_1 - \alpha_1\lambda_1 - \alpha_2\lambda_2$ with $E(w_1 \mid t^* > 0, s^* > 0) = 0$, and λ_1 and λ_2 are highly nonlinear functions of θ_1 ρ, and θ_2. As Tunali (1986) notes, λ_1 and λ_2 are the double-selection analogs of the inverse Mill's ratio that arises in the context of single-selection. The parallel regression function for equation (10) is given by

$$E(s \mid X, \psi) = X\beta_2 + \eta_1\lambda_1 + \eta_2\lambda_2 + \sigma_2 w_2 \qquad (15)$$

where η_1 and η_2 are regression coefficients and $w_2 = e_2 - \eta_1\lambda_1 - \eta_2\lambda_2$ with $E(w_2 \mid t^* > 0, s^* > 0) = 0$.

In order to estimate (14) and (15), estimates of λ_1 and λ_2 must first be constructed. To do this, estimates of ρ, θ_1, and θ_2, are first obtained via estimation of a conditional bivariate probit model in which T and S are the dependent variables and X and Z are the respective vectors of explanatory variables. This is where the additional variable in Z is necessary to identify the model. The estimates $\hat{\rho}$, $\hat{\theta}_1$, and $\hat{\theta}_2$, and are then substituted into the formulas for λ_1 and λ_2 to get the estimates $\hat{\lambda}_1$ and $\hat{\lambda}_2$. Substituting predicted variables $\hat{X}$ for X, the appropriate regressions to be run on the sample for which T = 1 and S = 1 that account for potential endogeneity of right hand side variables as well as sample selection issues are thus given by

$$E(t \mid \hat{X}, \psi) = \hat{X}\beta_1 + \alpha_1\hat{\lambda}_1 + \alpha_2\hat{\lambda}_2 + \sigma_1 w_1 \qquad (14')$$

$$E(s \mid \hat{X}, \psi) = \hat{X}\beta_2 + \eta_1\hat{\lambda}_1 + \eta_2\hat{\lambda}_2 + \sigma_2 w_2. \qquad (15')$$

Note that the errors are heteroscedastic because of the inclusion of $\hat{\lambda}_1$ and $\hat{\lambda}_2$. In addition, additional corrections to the standard errors should be made because of the substitution of the predicted variables $\hat{X}$ for X.

VI. Empirical Results

Before (14′) and (15′) can be estimated, the potentially endogenous variables in X need to be replaced by predicted variables and the selectivity correction terms need to be constructed. Table 1 shows the predicting equations for the price of schooling (tuition and fees), the amount of scholarships/grants received, and the child's income. Because

parents' income, parents' education, and student and family characteristics enter the main transfer and schooling equations (with the exception of parents' income, all as demographic controls to account for heterogenous preferences), they are included as within-model exogenous right-hand-side variables in the predicting equations. In addition, 654 high school dummies are included as exogenous out-of-model instruments to identify the predictions. In the price of schooling equation, these school dummies are intended to capture the average price of postsecondary schooling faced by students from a given high school. In the scholarship/grant equation they play a similar role, capturing the average scholarship/grant award. Finally, in the child's income equation, these school dummies are intended to control for local labor market conditions. In all three of these equations the school dummies are jointly significant at the 1% level.

One set of alternative predicting equations that were estimated but rejected used school characteristics data, county-level economic indicators, regional dummies, and state-level public and private tuition data as instruments. Another set of predicting equations used state dummies. The predicting equations with school dummies explained the most variation, however, and so were chosen over these alternatives.

Because the price of schooling and the scholarship/grant amount received are observed only for those respondents enrolled in postsecondary school, a single selectivity correction term λ has been included in their predicting equations. Note that the coefficient on the lambda term is large and significant in both equations. The results from the first-stage enrollment probit used to create this lambda term are reported in appendix Table A4.

The bivariate probit coefficients used in constructing the two sample selection terms $\hat{\lambda}_1$ and $\hat{\lambda}_2$ are shown in Table 2.[4] Identification requires one exclusion restriction. Therefore, the percent of the child's high school's 1978-79 senior class that was in college in 1980, a measure of the average probability a child from a given high school will be accepted into college, is included in the enrollment probit but is excluded from the receipt equation.

Transfers

The parental transfer equation is estimated on the sample of postsecondary students who receive a transfer from their parents. Table 3a presents the results from three different specifications of this regression. Column (1) reports the OLS results, column (2) reports the least squares results based on predicted variables, and column (3) reports the least squares results using predicted variables and correcting for double selection. While a formal specification test for the exogeneity of the right hand side variables has not yet been performed[5], the fact that the coefficient estimates are affected by substitution of the predicted variables for the potentially endogenous variables suggests that they are indeed endogenous. In addition, a formal F test rejects the null hypothesis that the coefficients on the selection correction terms are both equal to zero at the 1% level of significance, indicating that it is necessary to correct for double selectivity bias as well. Hence, specification (3) is the preferred specification. The OLS (1) and predicted variables (2) specifications are provided for comparison purposes.

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[4] The estimate of the correlation between the error terms in the receipt and enrollment probits, $\hat{\rho}$, is not statistically significant, suggesting that the two probit equations could have been estimated separately.

[5] Results of formal exogeneity tests will be reported in the next draft of this paper after standard errors are corrected to account for use of predicted right-hand-side variables.

The key coefficients for testing the altruism hypothesis of the unitary preference model are the coefficients on parents' and child's incomes. Recall that both child's income and parents' income are measured in tens of thousands of dollars. Therefore, the results indicate that an increase in child's income by $10,000 results in a reduction of parental transfers of $1,381.13, while an increase in parents' income by the same amount results in an increase in transfers of only $736.26. Hence, schooling-related parental transfers appear to be more responsive to the child's income than to the parents' income. Together, these estimated coefficients indicate that an increase in child's income by ten-thousand dollars, along with a simultaneous decrease in parents' income by ten-thousand dollars, results in a reduction in parental transfers of only $2,117.39. This estimate is $7882.61 less than the reduction of $10,000 predicted by the unitary preference model, suggesting that the unitary preference model should be rejected. An F test that the child's income coefficient minus the parents' income coefficient equals -$10,000 does in fact reject the unitary preference model at the 1% level of significance.

It is important to note that measurement error may be biasing the individual income coefficients and thus the total reduction in transfers towards zero. However, a very large amount of measurement error would need to be present to bias a true total reduction of $10,000 to the level of $2,117.39 I have estimated. For example, if there is measurement error in the child's income variable but not the parents' income variable, the measurement error variance of child's income would have to account for 85 percent of the total variance of child's income. On the other hand, if there is measurement error in the parents' income variable but not in the child's income variable, the measurement error variance of parents' income would have to account for 91 percent of the total

variance of parents' income. Finally, if both variables are measured with error such that each of their coefficients is subject to the same dollar amount of bias ($3,941.31 apiece), then the measurement error variance of child's income would have to account for 74 percent of its total variance and the measurement error variance of parents' income would have to account for 84 percent of its total variance. Thus, even if a large amount of measurement error is present in either or both of the income variables, the unitary preference model can still be rejected.

Table 3b shows the transfer results disaggregated by disagreement status. Column (1) gives the estimates of the transfer regression for the group of students whose parents want more schooling for their child than their child expects to obtain. Column (2) gives the estimates for those students who expect to obtain the level of schooling their parents desire. Finally, column (3) gives the estimates for those students whose parents want less schooling for them than they expect for themselves.

The unitary preference model is rejected across all three subgroups. While rejection of the unitary preference model is expected for the parents want more and parents want less groups, it is interesting that the unitary preference model is also rejected for the no disagreement group. One possibility is that some students may be improperly classified into the "no disagreement" subgroup. Recall that students are asked how much schooling they *expect* to obtain, rather than how much they wish to obtain. Therefore, if a child reports that he expects to obtain more schooling than he would wish given that he expects to bow to parental pressure (parents have all or most of the bargaining power), then a disagreement variable based on these survey responses is biased against indicating disagreement. Another possibility is that the level of postsecondary schooling is not the

relevant source of disagreement. Rather, schooling-related transfers may be affected by disagreement over the total expenditures on schooling, which depend on school quality and/or prestige, or the financing of the child's postsecondary education. Thus, if the source of disagreement is something other than the level of schooling, students may be improperly classified.

Years of Postsecondary Schooling

Recall that the years of postsecondary schooling variable is defined as the number of years of postsecondary schooling attained, given that some postsecondary schooling is undertaken, and that the years of postsecondary schooling regression is estimated for the sample of postsecondary students who receive a transfer (i.e. are cooperating with their parents). Table 4a presents the results from three different specifications of the years of postsecondary schooling regression. Column (1) reports the OLS results, column (2) reports the least squares results based on predicted variables, and column (3) reports the least squares results using predicted variables and correcting for double selection. Again, specification (3) is the preferred specification, with the results in columns (1) and (2) presented for comparison purposes.

The key coefficients for testing the income-pooling hypothesis of the unitary preference model are the coefficients on parents' and child's incomes. The coefficient on child's income is negative but not statistically significant. The coefficient on parents' income, however, is positive and significant, indicating that a $10,000 increase in parents' income results in an increase in years of postsecondary schooling by .21 years. An F-test, however, does not allow rejection of the income-pooling hypothesis, even

though the two coefficients are different in sign and significance. Both the insignificance of the child's income coefficient and the significant, but small, coefficient on the parents' income variable suggest that measurement error may be biasing the results towards zero, and away from a rejection of income-pooling.

Table 4b shows the results for the years of postsecondary schooling equation for the different subsamples based on disagreement status. For the parents want more group, neither the child's income nor the parents' income has a significant effect on years of postsecondary schooling, and an F test shows that the income-pooling hypothesis cannot be rejected. Again, measurement error is probably biasing the coefficients toward zero.

For the no disagreement group, child's income is negative but insignificant. Parents' income, on the other hand, is positive and significant, indicating that a $10,000 increase in parents' income increases years of postsecondary schooling attained by .32 years. However, even though child's income has no effect and parents' income has a positive and significant effect, the hypothesis that the two coefficients are not statistically different from each other cannot be rejected. Again, measurement error may be biasing both the parents' and child's income coefficients toward zero and away from rejection of income-pooling.

For the parents want less group, however, child's income is positive and almost significant, while parents' income is negative and significant. Note that the signs of these coefficients are totally opposite to their signs for the other two groups. More importantly, a negative and significant parents' income coefficient is not consistent with the unitary preference model but it is consistent with the bargaining model. If a child's parents use their bargaining power to decrease the level of postsecondary schooling, the parents'

income coefficient may indeed be negative. The estimated effects are even significant enough for this group to reject the income-pooling hypothesis and, hence, the unitary preference model.

In summary, with the exception of the parents want less group, the income-pooling hypothesis, and hence, the unitary preference model, cannot be rejected. Measurement error is one possibility for the rejection of income-pooling. However, there are other possibilities. One possibility is that years of postsecondary schooling, given that some postsecondary schooling is undertaken, may not be the true source of disagreement. It may instead be the case that the decision to enroll at all or how to finance a given level of postsecondary education may be the true source of bargaining. Another possibility is that a child's income is not a good measure of a child's bargaining power. Average predicted child's income is very small, both in absolute terms and relative to average parents' income. Thus, it is reasonable that child's income may have very little effect on schooling outcomes while parents' income has a much larger effect. This explanation is consistent with my finding that parents' income is often significant where child's income is not. A better measure might be the child's wage. A child might threaten not to go to school and instead go to work. In this case, at the threat point the child's income would be made up mostly of labor income, and the potential wage might be a better indicator of bargaining power. On the other hand, the child might threaten not to work to pay for his fair share of schooling expenditures. In this case too, the child's potential wage might be a better indicator of bargaining power than the child's predicted total income.

2-Year Versus 4-Year Program

An alternative level of schooling variable is initial program choice. This variable takes on a value of 1 if a 4-year postsecondary program is chosen and a value of 0 if a 2-year postsecondary program is chosen, given that either a 2-year or a 4-year program is chosen.[6] A linear probability model is estimated on the sample of postsecondary students who receive a transfer and attend either a 2-year or a 4-year program.

Table 5a presents the results from three specifications, although the results from specification (3) are discussed. As in the years of postsecondary schooling regression, child's income is insignificant. In this case, however, parents' income is also insignificant. The income-pooling hypothesis and hence the unitary preference model cannot be rejected.

Table 5b disaggregates the results by disagreement status. As in the results for the full sample, child's income is insignificant for all subgroups. However, unlike the results for the full sample, the parents' income coefficient is positive and significant for the no disagreement subgroup. However, the income-pooling hypothesis cannot be rejected for any of the subgroups.

Alternative Income Variables

Because parents' income and child's income are key variables, it is necessary to test the robustness of the estimates and hypothesis tests to alternative constructions of these variables. Recall that the parents' income variable was predicted using the CPS

[6] Students choosing other programs, e.g. a 1-year vocational program, are excluded. An alternative way to define this program choice variable allows it to take on a value of 1 if the child attends a 4-year program and a value of 0 if the child attends any other postsecondary program. Defining the initial program choice variable in this way does not materially affect the results.

coefficients in appendix Table A2. An alternative variable that could have been used, however, was constructed in a cruder manner by subtracting child's income from the midpoint of the family income range. Table 6 provides comparisons of the results based on these alternative parents' income variables.

The estimates in Table 6 account for both potential endogeneity of the right-hand-side variables and potential double selectivity bias. The estimates in each of the parents' income columns are the full-sample results from specification (3) for the relevant dependent variable. The estimates in the alternative column are the results of regressions using the alternative parents' income variable. Note that, in response to an increase in child's income by $10,000 and a simultaneous decrease in parents' income by $10,000, the $2,130.48 reduction when the alternative income variable is used is not that different from the $2,117.39 reduction when the preferred variable is used. Hence, rejection of the transfer hypothesis of the unitary preference model is robust to the specific parents' income variable used.

With respect to years of postsecondary schooling, note that the coefficient estimates are not that different between the two alternatives and that the income-pooling hypothesis cannot be rejected under either alternative. With respect to the 2-year versus 4-year choice, the income coefficients are insignificant regardless of which measure of parents' income is used. In addition, the income-pooling hypothesis cannot be rejected under either alternative. It thus appears that both sets of schooling results are robust to the construction of the parents' income variable.

Another key variable is the child's annual 1982 income from all sources except scholarships and grants and gifts from relatives. However, because the relevant school

year is 1982-83, an alternative child's income variable, the average of the child's 1982 and 1983 annual incomes, was constructed. The results in Table 7 clearly show, however, that neither the point estimates nor the hypothesis test results differ between the two alternatives. With respect to transfers, the altruism hypothesis of the unitary preference model is rejected by the data. With respect to years of schooling and initial program choice, however, the income-pooling hypothesis cannot be rejected.

VII. Conclusions

This paper addresses parent-child disagreement over schooling-related transfers from parents to child and the level of postsecondary education by introducing imperfectly altruistic parents and parent-child bargaining to the postsecondary education decision. A theoretical bargaining model of schooling and transfer decisions is formulated and its implications compared to those of the corresponding unitary preference model, suggesting testable hypotheses regarding parental altruism and income-pooling. Restricted-use High School and Beyond Survey data are used to test these hypotheses, with mixed results. On one hand, the evidence with respect to parental transfers rejects the altruism hypothesis, suggesting that the unitary preference model does not apply. On the other hand, the evidence with respect to the level of postsecondary schooling cannot reject the income-pooling hypothesis, except for the parents want less group. For this group, the evidence is very consistent with the predictions of the bargaining model.

There is evidence from the transfer results that parent-child conflict affects at least some aspect of the postsecondary schooling decision, although it may not affect years of postsecondary schooling or the 2-year versus 4-year choice. Therefore, future research

would do well to explore some other postsecondary choices such as school quality, total schooling expenditures, and/or how postsecondary education is financed.

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Table 1: Predicting Equations

	price (tuition and fees)		scholarships/grants		child's income	
Explanatory Variables	**coefficient**	**t-statistic**	**coefficient**	**t-statistic**	**coefficient**	**t-statistic**
intercept	-1379.02	-0.47	-3511.73 ***	-6.13	0.42 **	2.16
parents' income	76.41 ***	2.66	-64.22 ***	-3.62	-0.04 ***	-7.74
standardized test score	11.60 ***	4.05	12.29 ***	6.96	0.00 ***	-4.27
standardized high school GPA	1337.94 ***	8.79	993.80 ***	9.85	0.02 *	-1.81
gender dummy (1 = male)	81.98	0.83	180.81 ***	2.86	0.05 ***	3.07
Hispanic dummy	166.44	1.06	398.53 ***	3.77	-0.03	-1.00
Native American dummy	632.79	1.04	622.09 *	1.94	0.00	0.04
Asian/Pacific Islander dummy	-59.00	-0.22	54.79	0.31	-0.10 **	-2.00
African American dummy	605.42 **	2.53	691.58 ***	3.93	-0.22 ***	-6.32
number of siblings	-205.22 ***	-5.02	-23.90	-0.80	0.02 ***	3.14
number of older siblings	74.35 **	1.98	17.95	0.67	-0.02 **	-2.54
traditional family dummy	47.64	0.43	-221.44 ***	-2.90	-0.03 *	-1.73
rooms in home	117.46 ***	4.48	-2.01	-0.11	0.01 **	2.42
parents' highest education dummies:						
high school graduate	-180.85	-0.96	-101.26	-0.77	0.03	0.85
less than 2 years vocational school	574.50 ***	3.45	623.96 ***	4.44	0.03	1.13
2+ years vocational school	273.71 *	1.66	291.91 **	2.56	-0.03	-1.11
less than 2 years college	353.40 **	2.13	225.60 **	2.17	-0.03	-1.04
2 or more years college	600.11 ***	3.85	209.92 **	2.05	-0.02	-0.96
4 or 5 year college degree	682.80 ***	3.87	513.75 ***	4.33	-0.03	-1.10
master's degree	826.55 ***	4.16	258.45 **	2.15	0.02	0.69
(654 school dummies not reported)						
λ	1619.24 ***	4.48	1183.24 ***	5.66		
R-squared		0.35		0.32		0.21
Number of Observations		3287		3287		5015

*** indicates significance at 1% level
** indicates significance at 5% level
* indicates significance at 10% level

Table 2: Bivariate Probit for Double Selection Correction

	receipt (probit equation)		enrollment (selection equation)	
Explanatory Variables	**coefficient**	**z**	**coefficient**	**z**
intercept	-0.76676 **	-2.09	-2.79522 ***	-17.96
predicted price	0.00006 ***	3.21	-0.00001	-0.63
predicted grant	-0.00005	-1.62	-0.00004	-1.32
predicted child's income	-0.18563	-1.40	-0.45215 ***	-4.62
parents' income	0.06699 ***	4.32	0.03023 **	2.13
standardized test score	0.00488 ***	2.92	0.01125 ***	10.79
standardized high school GPA	0.12079 *	1.83	0.67379 ***	16.81
gender dummy (1 = male)	-0.19479 ***	-4.02	-0.01535	-0.35
Hispanic dummy	0.15108 **	2.14	0.15555 ***	2.57
Native American dummy	-0.15921	-0.68	0.00817	0.05
Asian/Pacific Islander dummy	0.12855	0.97	0.50305 ***	3.14
African American dummy	0.08959	0.91	0.47267 ***	5.74
number of siblings	-0.09722 ***	-4.38	-0.08633 ***	-4.61
number of older siblings	0.03378	1.61	0.04746 ***	2.58
traditional family dummy	0.14603 **	2.52	0.13270 ***	2.71
number of rooms in home	0.01799	1.31	0.03059 **	2.54
percent of high school class of 78-79 attending post-secondary school in 1980	-	-	0.00898 ***	8.86
parents' highest education dummies:				
high school graduate	0.07645	0.66	0.06083	0.66
less than 2 years vocational school	-0.04812	-0.52	0.23638 ***	3.20
2+ years vocational school	0.06278	0.70	0.33244 ***	4.49
less than 2 years college	-0.01209	-0.14	0.32608 ***	4.49
2 or more years college	0.16512 *	1.89	0.58452 ***	8.49
4 or 5 year college degree	0.18202 *	1.83	0.68967 ***	7.84
master's degree	0.28004 ***	2.59	0.53848 ***	5.25
Log Likelihood	-4519			
No. Observations	5015			
Censored Observations	1728			
Uncensored Observations	3287			
			95% Confidence Interval	
ρ	0.05870		-0.30025	0.40309
LR test of independent equations (ρ = 0):	**χ^2 =**	0.10	**Prob > χ^2 =**	0.7522

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

Table 3a: Transfers: Regression Results and Hypothesis Tests

	(1) No corrections (OLS)		(2) Predicted Values		(3) Predicted Values and Double Selection	
Explanatory Variables	**coefficient**	**t-statistic**	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**
intercept	-514.23	-1.42	-443.30	-1.04	-14905.61 ***	-4.12
price of schooling	0.53 ***	25.58	-	-	-	-
predicted price	-	-	0.64 ***	15.10	1.04 ***	9.66
grant	-0.54 ***	-15.24	-	-	-	-
predicted grant	-	-	-0.52 ***	-6.64	-0.89 ***	-7.67
child's income	-791.76 ***	-4.24	-	-	-	-
predicted child's income	-	-	-185.76	-0.59	-1381.13 ***	-3.31
parents' income	275.85 ***	9.20	268.37 ***	7.53	736.26 ***	6.17
standardized test score	7.78 ***	2.76	7.09 **	2.17	38.58 ***	4.37
standardized high school GPA	253.30 **	2.56	174.31	1.54	789.99 ***	3.55
gender dummy (1 = male)	-23.32	-0.22	-33.09	-0.28	-1501.16 ***	-3.91
Hispanic dummy	-64.21	-0.44	-73.99	-0.45	936.41 ***	3.34
Native American dummy	424.20	0.71	58.44	0.09	-1293.06	-1.48
Asian/Pacific Islander dummy	458.50 *	1.73	499.25 *	1.69	1185.06 ***	3.62
African American dummy	108.94	0.58	121.31	0.55	486.87 *	1.95
number of siblings	-141.83 ***	-2.93	-142.11 ***	-2.62	-861.79 ***	-4.51
number of older siblings	81.48 *	1.71	79.89	1.51	313.93 ***	3.98
traditional family dummy	-0.81	-0.01	-11.40	-0.08	1073.79 ***	3.36
number of rooms in home	93.08 ***	3.08	88.61 ***	2.61	222.64 ***	4.45
parents' highest education dummies:						
high school graduate	98.02	0.38	-9.59	-0.03	565.84 *	1.93
less than 2 years vocational school	-168.85	-0.81	-239.99	-1.03	-722.36 ***	-3.05
2+ years vocational school	-31.80	-0.17	-83.39	-0.40	239.07	1.08
less than 2 years college	-79.20	-0.42	-32.81	-0.16	-288.18	-1.34
2 or more years college	470.23 ***	3.00	387.74 **	2.23	1351.89 ***	4.28
4 or 5 year college degree	13.39	0.08	-75.20	-0.39	967.75 ***	2.84
master's degree	118.78	0.61	35.73	0.16	1688.79 ***	3.54
λ_1	-	-	-	-	13403.60 ***	4.24
λ_2	-	-	-	-	-872.02 *	-1.77
No. Observations	1886		1886		1886	
R-squared	0.40		0.26		0.27	

Tests of Parameter Restrictions

	F	**Prob > F**	**F[1]**	**Prob > F**	**F[1]**	**Prob > F**
Ho: $\lambda_1 = \lambda_2 = 0$	-	-	-	-	9.06	0.0001
Ho: altruism hypothesis	2267.89	0.0000	959.48	0.0000	244.42	0.0000
Reject Unitary Preference Model?	yes		yes		yes	

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

[1] calculated using uncorrected standard errors

Table 3b: Transfers: Comparisons by Conflict Status

	Parents Want More		No Disagreement		Parents Want Less	
Explanatory Variables	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**
intercept	-11212.12	-1.50	-13831.79 ***	-3.40	-3994.30	-0.39
predicted price	1.07 ***	4.67	0.97 ***	7.64	0.72 **	2.41
predicted grant	-1.03 ***	-4.14	-0.84 ***	-5.83	-0.57	-1.63
predicted child's income	-1941.27 **	-2.41	-1033.17 *	-1.94	-692.15	-0.58
parents' income	551.03 **	2.26	754.42 ***	5.48	362.31	1.06
standardized test score	20.39	1.05	36.00 ***	3.70	40.74	1.46
standardized high school GPA	904.36 **	2.02	690.94 **	2.53	-539.07	-0.81
gender dummy (1 = male)	-476.43	-0.57	-1527.07 ***	-3.55	-1113.74	-1.00
Hispanic dummy	1221.20 *	1.94	565.38 *	1.67	548.62	0.68
Asian/Pacific Islander dummy	720.34	1.06	1144.08 ***	3.03	761.35	0.51
African American dummy	659.28	1.29	470.09	1.41	-179.83	-0.21
number of siblings	-460.88	-1.14	-856.72 ***	-4.10	-455.48	-0.87
number of older siblings	223.82	1.37	279.84 ***	2.95	104.78	0.46
traditional family dummy	249.24	0.38	1244.43 ***	3.68	-165.51	-0.17
number of rooms in home	189.81 *	1.68	236.77 ***	4.00	192.08	1.26
parents' highest education dummies:						
high school graduate	1313.34	1.41	341.04	0.98	-141.75	-0.17
less than 2 years vocational school	-602.87	-1.18	-673.41 **	-2.21	-793.78	-0.93
2+ years vocational school	1120.30 **	2.03	-122.35	-0.46	-774.29	-0.95
less than 2 years college	103.43	0.21	-332.84	-1.29	-861.49	-1.14
2 or more years college	1390.46 **	2.14	1158.72 ***	3.04	-25.16	-0.03
4 or 5 year college degree	962.75	1.41	538.03	1.31	632.76	0.65
master's degree	1229.49	1.34	1164.24 **	2.13	1313.17	0.81
λ_1	8527.80	1.34	12848.51 ***	3.68	5834.83	0.62
λ_2	64.15	0.05	-1226.96 **	-2.10	-777.21	-0.41
No. Observations	341		1207		203	
R-squared	0.33		0.27		0.29	

Tests of Parameter Restrictions

	F	**Prob > F**	**F[1]**	**Prob > F**	**F[1]**	**Prob > F**
Ho: $\lambda_1 = \lambda_2 = 0$	0.99	0.3710	7.39	0.0006	0.20	0.8167
Ho: altruism hypothesis	59.66	0.0000	175.56	0.0000	40.96	0.0000
Reject Unitary Preference Model?	yes		yes		yes	

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

[1] calculated using uncorrected standard errors

Table 4a: Years of Postsecondary Schooling: Regression Results and Hypothesis Tests

	(1) No corrections (OLS)		(2) Predicted Values		(3) Predicted Values and Double Selection	
Explanatory Variables	**coefficient**	**t-statistic**	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**
intercept	0.070973	0.22	-0.133667	-0.39	-5.178087 *	-1.74
price	0.000002	0.115	-	-	-	-
predicted price	-	-	0.000040	1.15	0.000181 **	2.12
grant	0.000040	1.24	-	-	-	-
predicted grant	-	-	0.000042	0.64	-0.000090	-0.90
child's income	-0.544020 ***	-3.16	-	-	-	-
predicted child's income	-	-	0.098056	0.40	-0.304944	-0.89
parents' income	0.043818	1.61	0.051652 *	1.76	0.214052 **	2.249
standardized test score	0.019279 ***	7.78	0.019526 ***	7.45	0.030447 ***	4.21
standardized high school GPA	0.514201 ***	5.85	0.519258 ***	5.71	0.736245 ***	3.96
gender dummy (1 = male)	0.405236 ***	4.42	0.375571 ***	4.01	-0.133082	-0.45
Hispanic dummy	0.290486 **	2.23	0.288831 **	2.17	0.634959 ***	2.56
Native American dummy	1.590311 **	2.47	1.553685 **	2.40	1.109641	1.32
Asian/Pacific Islander dummy	0.425187 *	1.89	0.475906 **	2.10	0.722793 ***	2.63
African American dummy	0.433769 **	2.43	0.456423 **	2.39	0.591760 **	2.48
number of siblings	-0.004550	-0.11	0.000444	0.01	-0.250638 *	-1.72
number of older siblings	-0.010392	-0.25	-0.009035	-0.21	0.073716	1.15
traditional family dummy	0.033247	0.29	0.040529	0.35	0.420920 *	1.73
number of rooms in home	0.024367	0.90	0.010314	0.37	0.057103	1.49
parents' highest education dummies:						
high school graduate	-0.042683	-0.19	-0.055078	-0.25	0.137384	0.58
less than 2 years vocational school	0.257261	1.37	0.235599	1.24	0.054620	0.24
2+ years vocational school	0.438562 ***	2.67	0.459351 ***	2.79	0.568689 ***	2.90
less than 2 years college	0.629228 ***	3.66	0.649786 ***	3.76	0.560537 ***	3.05
2 or more years college	0.664953 ***	4.86	0.650116 ***	4.73	0.979422 ***	3.74
4 or 5 year college degree	0.732265 ***	4.79	0.728493 ***	4.74	1.082565 ***	3.75
master's degree	0.732481 ***	4.12	0.690682 ***	3.85	1.249090 ***	3.20
λ_1	-	-	-	-	4.680501 *	1.82
λ_2	-	-	-	-	-0.325557	-0.77
No. Observations	1330		1330		1330	
R-squared	0.22		0.21		0.22	

Tests of Parameter Restrictions

	F	**Prob > F**	**F[1]**	**Prob > F**	**F[1]**	**Prob > F**
Ho: $\lambda_1 = \lambda_2 = 0$	-	-	-	-	1.73	0.1776
Ho: pooled income hypothesis	11.64	0.0007	0.04	0.8477	1.60	0.2060
Reject Unitary Preference Model?	yes		no		no	

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

[1] calculated using uncorrected standard errors

Table 4b: Years of Postsecondary Schooling: Comparisons by Conflict Status

	Parents Want More		No Disagreement		Parents Want Less	
Explanatory Variables	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**
intercept	-10.207390	-1.41	-7.165206 *	-1.73	14.971430 *	1.91
predicted price	0.000218	1.15	0.000237 **	2.00	-0.000351 *	-1.67
predicted grant	-0.000237	-1.06	-0.000094	-0.70	0.000210	0.83
predicted child's income	-0.679350	-0.65	-0.329114	-0.66	1.256721	1.60
parents' income	0.251355	0.99	0.328816 **	2.52	-0.453676 *	-1.96
standardized test score	0.039051 **	2.13	0.033587 ***	3.37	-0.011880	-0.62
standardized high school GPA	1.289069 ***	2.79	0.773249 ***	3.07	-0.579104	-1.16
gender dummy (1 = male)	-0.480488	-0.64	-0.339830	-0.85	1.372030 *	1.85
Hispanic dummy	1.335424 **	1.99	0.766574 **	2.30	-0.951277 *	-1.72
Asian/Pacific Islander dummy	1.121090 *	1.78	0.858962 **	2.30	-0.913756	-1.09
African American dummy	0.679919	1.22	0.839205 ***	2.70	-1.039699	-1.54
number of siblings	-0.596762 *	-1.72	-0.353804 *	-1.80	1.033982 **	2.60
number of older siblings	0.291931 *	1.71	0.107088	1.31	-0.610716 ***	-3.31
traditional family dummy	0.616906	1.03	0.575168 *	1.78	-0.406617	-0.56
number of rooms in home	0.147669	1.41	0.078270	1.57	-0.134312	-1.35
parents' highest education dummies:						
high school graduate	0.451674	0.64	0.288736	0.96	-0.802946	-1.12
less than 2 years vocational school	-0.533882	-0.77	0.115647	0.40	0.420645	0.63
2+ years vocational school	0.821084	1.41	0.516377 **	2.07	1.374574 **	2.26
less than 2 years college	0.837723	1.60	0.485281 **	2.15	0.142496	0.32
2 or more years college	1.872026 ***	2.70	0.961541 ***	2.72	-0.673993	-0.85
4 or 5 year college degree	1.683541 **	2.19	1.075823 ***	2.83	-0.214891	-0.27
master's degree	2.176424 **	2.23	1.352812 ***	2.60	-0.899890	-0.85
λ_1	7.062767	1.17	6.894794 *	1.94	-11.237680 *	-1.68
λ_2	1.402306	1.20	-0.854664	-1.54	-0.959615	-0.69
No. Observations	226		867		140	
R-squared	0.17		0.23		0.38	

Tests of Parameter Restrictions

	F	**Prob > F**	**F[1]**	**Prob > F**	**F[1]**	**Prob > F**
Ho: $\lambda_1 = \lambda_2 = 0$	1.65	0.1949	2.72	0.0664	2.15	0.1208
Ho: pooled income hypothesis	0.64	0.4263	1.24	0.2651	3.20	0.0764
Reject Unitary Preference Model?	no		no		yes	

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

[1] calculated using uncorrected standard errors

Table 5a: Initial Program Choice: Linear Probability Model Results and Hypothesis Tests

	(1)		(2)		(3)	
	No corrections (OLS)		Predicted Values		Predicted Values and Double Selection	
Explanatory Variables	**coefficient**	**t-statistic**	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**
intercept	-0.039276	-0.55	-0.025261	-0.31	-0.173804	-0.339
price	0.000040 ***	8.25	-	-	-	-
predicted price	-	-	0.000053 ***	8.296	0.000060 ***	4.13
grant	0.000014 **	2.39	-	-	-	-
predicted grant	-	-	0.000028 **	2.30	0.000023	1.31
child's income	-0.067789 *	-1.86	-	-	-	-
predicted child's income	-	-	-0.009603	-0.17	-0.016128	-0.23
parents' income	0.004120	0.75	0.006656	1.11	0.014232	0.876
standardized test score	0.002223 ***	3.59	0.002167 ***	3.39	0.002359 *	1.75
standardized high school GPA	0.137010 ***	7.08	0.120276 ***	5.77	0.116794 ***	3.46
gender dummy (1 = male)	0.040412 **	2.08	0.030959	1.55	0.005896	0.12
Hispanic dummy	-0.110045 ***	-3.67	-0.116469 ***	-3.78	-0.103082 **	-2.30
Native American dummy	0.184881 **	1.97	0.133771	1.36	0.115090	1.07
Asian/Pacific Islander dummy	-0.032984	-0.68	-0.032403	-0.68	-0.027742	-0.53
African American dummy	0.087401 **	2.40	0.065247	1.61	0.058322	1.28
number of siblings	0.009234	1.01	0.011533	1.22	0.000684	0.03
number of older siblings	-0.005881	-0.66	-0.005811	-0.63	-0.002942	-0.24
traditional family dummy	-0.028172	-1.16	-0.021893	-0.87	-0.007673	-0.18
number of rooms in home	0.006781	1.15	0.003587	0.59	0.005441	0.73
parents' highest education dummies:						
high school graduate	-0.044608	-0.78	-0.045458	-0.79	-0.038731	-0.64
less than 2 years vocational school	0.056676	1.33	0.060311	1.38	0.044455	0.94
2+ years vocational school	0.114045 ***	3.03	0.109046 ***	2.84	0.103580 **	2.47
less than 2 years college	0.073966 *	1.90	0.082029 **	2.11	0.066695	1.58
2 or more years college	0.102355 ***	3.29	0.092387 ***	2.89	0.092167 *	1.83
4 or 5 year college degree	0.061569 *	1.81	0.059335 *	1.68	0.059127	1.07
master's degree	0.101079 ***	2.80	0.088931 **	2.39	0.103285	1.53
λ_1	-	-	-	-	0.235479	0.52
λ_2	-	-	-	-	-0.085164	-0.86
No. Observations	1691		1691		1691	
R-squared	0.23		0.20		0.20	

Tests of Parameter Restrictions

	F	**Prob > F**	**F[1]**	**Prob > F**	**F[1]**	**Prob > F**
Ho: $\lambda_1 = \lambda_2 = 0$	-	-	-	-	0.39	0.6741
Ho: pooled income hypothesis	3.89	0.0486	0.09	0.7641	0.15	0.6977
Reject Unitary Preference Model?	yes		no		no	

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

[1] calculated using uncorrected standard errors

Table 5b: Initial Program Choice: Comparisons by Conflict Status

	Parents Want More		No Disagreement		Parents Want Less	
Explanatory Variables	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**	**coefficient**	**t-statistic[1]**
intercept	-1.356022	-1.09	-0.628992	-1.20	-1.023616	-0.59
predicted price	0.000062 *	1.91	0.000078 ***	5.00	0.000074	1.65
predicted grant	-0.000003	-0.08	0.000005	0.26	-0.000012	-0.21
predicted child's income	-0.019237	-0.10	-0.102725	-1.21	0.025711	0.13
parents' income	0.061807	1.55	0.034163 **	2.04	0.018546	0.35
standardized test score	0.005746 *	1.68	0.002977 **	2.07	0.005130	1.13
standardized high school GPA	0.215930 ***	2.61	0.128191 ***	3.32	0.112588	0.97
gender dummy (1 = male)	-0.004135	-0.03	-0.089637 *	-1.66	-0.007767	-0.05
Hispanic dummy	-0.135735	-1.19	-0.047103	-0.95	-0.001020	-0.01
Asian/Pacific Islander dummy	0.098308	0.74	0.005778	0.10	0.026133	0.18
African American dummy	0.160218	1.46	0.020519	0.37	0.186256	1.43
number of siblings	-0.092712	-1.56	-0.019320	-0.74	0.018373	0.22
number of older siblings	0.013439	0.43	0.009385	0.72	-0.027714	-0.74
traditional family dummy	0.112324	1.05	0.000368	0.01	0.096582	0.71
number of rooms in home	0.013944	0.73	0.007855	0.89	0.038701 *	1.73
parents' highest education dummies:						
high school graduate	-0.068142	-0.38	-0.022756	-0.32	-0.063173	-0.34
less than 2 years vocational school	0.007983	0.06	0.017875	0.31	0.094430	0.86
2+ years vocational school	0.260403 **	2.22	0.090922 *	1.85	0.167863	1.57
less than 2 years college	0.021892	0.20	0.018169	0.36	0.122612	1.12
2 or more years college	0.321219 **	2.38	0.100845 *	1.80	-0.011955	-0.07
4 or 5 year college degree	0.278261 **	1.97	0.063719	1.05	0.054327	0.30
master's degree	0.274752	1.64	0.149804 **	2.12	0.079943	0.36
λ_1	0.701136	0.69	0.916494 **	1.98	0.640628	0.45
λ_2	0.375513	1.48	-0.244284 **	-2.04	-0.008958	-0.03
No. Observations	298		1092		192	
R-squared	0.24		0.19		0.27	

Tests of Parameter Restrictions

	F	**Prob > F**	**F[1]**	**Prob > F**	**F[1]**	**Prob > F**
Ho: $\lambda_1 = \lambda_2 = 0$	1.49	0.2281	3.01	0.0496	0.10	0.9028
Ho: pooled income hypothesis	0.16	0.6933	2.25	0.1340	0.00	0.9746
Reject Unitary Preference Model?	no		no		no	

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

[1] calculated using uncorrected standard errors

Table 6: Alternative Parents' Income Variables

	transfers		years		program choice	
Explanatory Variables	**Parents' Income**	**Alternative**	**Parents' Income**	**Alternative**	**Parents' Income**	**Alternative**
intercept	-14905.61 ***	-11692.80 ***	-5.178087 *	-2.334513	-0.173804	0.370049
predicted price	1.04 ***	0.84 ***	0.000181 **	0.000086	0.000060 ***	0.000045 ***
predicted grant	-0.89 ***	-0.39 ***	-0.000090	0.000117	0.000023	0.000030 **
predicted child's income	-1381.13 ***	-1087.08 **	-0.304944	-0.171950	-0.016128	0.008148
parents' income	736.26 ***	1043.40 ***	0.214052 **	0.206958	0.014232	-0.008901
standardized test score	38.58 ***	35.96 ***	0.030447 ***	0.024449 ***	0.002359 *	0.001073
standardized high school GPA	789.99 ***	511.81 **	0.736245 ***	0.581029 ***	0.116794 ***	0.091462 ***
gender dummy (1 = male)	-1501.16 ***	-1463.71 ***	-0.133082	0.115380	0.005896	0.053179
Hispanic dummy	936.41 ***	625.33 **	0.634959 ***	0.400305 *	-0.103082 **	-0.121953 ***
Native American dummy	-1293.06	-1651.11 *	1.109641	1.625855 *	0.115090	0.168006
Asian/Pacific Islander dummy	1185.06 ***	1043.57 ***	0.722793 ***	0.535829 *	-0.027742	-0.011242
African American dummy	486.87 *	558.55 **	0.591760 **	0.511630 *	0.058322	0.029680
number of siblings	-861.79 ***	-770.76 ***	-0.250638 *	-0.149323	0.000684	0.022233
number of older siblings	313.93 ***	275.93 ***	0.073716	0.038832	-0.002942	-0.008630
traditional family dummy	1073.79 ***	537.80 **	0.420920 *	0.113455	-0.007673	-0.045808
number of rooms in home	222.64 ***	92.26 **	0.057103	0.023413	0.005441	0.002123
parents' highest education dummies:						
high school graduate	565.84 *	1047.91 ***	0.137384	0.131523	-0.038731	-0.070251
less than 2 years vocational school	-722.36 ***	-593.30 **	0.054620	0.038789	0.044455	0.072578
2+ years vocational school	239.07	115.72	0.568689 ***	0.467092 **	0.103580 **	0.094596 **
less than 2 years college	-288.18	-232.55	0.560537 ***	0.487580 ***	0.066695	0.081502 *
2 or more years college	1351.89 ***	398.18 *	0.979422 ***	0.563188 ***	0.092167 *	0.074014 *
4 or 5 year college degree	967.75 ***	376.52	1.082565 ***	0.740168 ***	0.059127	0.042247
master's degree	1688.79 ***	1025.04 **	1.249090 ***	0.872514 ***	0.103285	0.067823
λ_1	13403.60 ***	9870.45 ***	4.680501 *	2.038983	0.235479	-0.214059
λ_2	-872.02 *	-60.99	-0.325557	-0.040267	-0.085164	-0.080473
No. Observations	1886	1701	1330	1196	1691	1531
R-squared	0.27	0.32	0.22	0.22	0.20	0.19
Reject Unitary Preference Model?	yes	yes	no	no	no	no

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

Table 7: Alternative Child's Income Variables

	transfers		years		program choice	
Explanatory Variables	**Child's Income**	**Alternative**	**Child's Income**	**Alternative**	**Child's Income**	**Alternative**
intercept	-14905.61 ***	-15046.46 ***	-5.178087 *	-5.304869 *	-0.173804	-0.115301
predicted price	1.04 ***	1.01 ***	0.000181 **	0.000176 **	0.000060 ***	0.000057 ***
predicted grant	-0.89 ***	-0.84 ***	-0.000090	-0.000074	0.000023	0.000024
predicted child's income	-1381.13 ***	-1210.66 ***	-0.304944	-0.447457	-0.016128	0.026394
parents' income	736.26 ***	757.92 ***	0.214052 **	0.219987 **	0.014232	0.012391
standardized test score	38.58 ***	38.89 ***	0.030447 ***	0.030295 ***	0.002359 *	0.002373 *
standardized high school GPA	789.99 ***	842.34 ***	0.736245 ***	0.763343 ***	0.116794 ***	0.113457 ***
gender dummy (1 = male)	-1501.16 ***	-1464.45 ***	-0.133082	-0.125535	0.005896	0.010726
Hispanic dummy	936.41 ***	847.32 ***	0.634959 ***	0.611713 ***	-0.103082 **	-0.110721 ***
Native American dummy	-1293.06	-1421.65	1.109641	1.050182	0.115090	0.122027
Asian/Pacific Islander dummy	1185.06 ***	1138.77 ***	0.722793 ***	0.656938 **	-0.027742	-0.018647
African American dummy	486.87 *	412.50 *	0.591760 **	0.519895 **	0.058322	0.067224
number of siblings	-861.79 ***	-871.31 ***	-0.250638 *	-0.257568 *	0.000684	0.004588
number of older siblings	313.93 ***	321.49 ***	0.073716	0.078055	-0.002942	-0.003929
traditional family dummy	1073.79 ***	1115.87 ***	0.420920 *	0.455527	-0.007673	-0.014251
number of rooms in home	222.64 ***	227.20 ***	0.057103	0.061739	0.005441	0.004330
parents' highest education dummies:						
high school graduate	565.84 *	354.68	0.137384	0.086394	-0.038731	-0.053971
less than 2 years vocational school	-722.36 ***	-792.26 ***	0.054620	0.017374	0.044455	0.049911
2+ years vocational school	239.07	149.13	0.568689 ***	0.541762 ***	0.103580 **	0.104607 **
less than 2 years college	-288.18	-373.75 *	0.560537 ***	0.520108 ***	0.066695	0.066989
2 or more years college	1351.89 ***	1346.70 ***	0.979422 ***	0.993178 ***	0.092167 *	0.088710 *
4 or 5 year college degree	967.75 ***	935.49 ***	1.082565 ***	1.087982 ***	0.059127	0.054839
master's degree	1688.79 ***	1568.67 ***	1.249090 ***	1.254856 ***	0.103285	0.097501
λ_1	13403.60 ***	13253.94 ***	4.680501 *	4.769998 *	0.235479	0.155186
λ_2	-872.02 *	-626.08	-0.325557	-0.234480	-0.085164	-0.073964
No. Observations	1886	1879	1330	1327	1691	1684
R-squared	0.27	0.27	0.22	0.22	0.20	0.20
Reject Unitary Preference Model?	yes	yes	no	no	no	no

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

Table A1: Full and Analysis Sample Means

Variable Name	Full Sample	Analysis Sample
gender	0.50	0.47
Hispanic	0.22	0.16
Native American	0.02	0.01
Asian/Pacific Islander	0.03	0.03
African American	0.14	0.09
Mid-Atlantic	0.18	0.20
East North Central	0.19	0.22
West North Central	0.07	0.09
South Atlantic	0.16	0.12
East South Central	0.04	0.04
West South Central	0.11	0.08
Mountain	0.05	0.04
Pacific	0.14	0.14
urban	0.24	0.19
rural	0.25	0.27
Number of Observations	14,825	5,015

Table A2: CPS Parents' Income Regression

Explanatory Variable	Parameter Estimate		t-statistic
Intercept	3439.16	**	2.32
urban	622.41	**	2.34
traditional family dummy	2462.14	***	7.68
siblings	-1041.48	***	-12.10
child's wage and salary income	-0.86	***	-17.27
family income categories:			
$8,000 - $14,999	5540.04	***	10.92
$15,000 - $19,999	9831.30	***	18.06
$20,000 - $24,999	14165.00	***	25.74
$25,000 - $29,999	18281.00	***	32.59
$30,000 - $39,999	24025.00	***	46.10
$40,000 - $49,999	31430.00	***	55.01
$50,000 or more	50766.00	***	87.69
parents' highest education categories:			
high school graduate	1189.97	***	3.55
less than 2 years post-secondary	1987.29	***	3.55
2-3 years post-secondary	1901.80	***	4.10
4-5 year college degree	5418.62	***	11.85
6 or more years post-secondary	10787.00	***	19.77
(50 state dummies not reported)			
No. Observations	6,937		
R-Squared	0.77		

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level

Table A3: Key Variable Sample Statistics

Variable Name	No. Observations	Mean	Standard Deviation
enrollment dummy	5015	0.66	0.48
price of schooling	3287	2417.20	2623.10
predicted price of schooling	5015	2241.89	1570.33
scholarship/grant amount	3287	881.42	1686.88
predicted scholarship/grant amount	5015	844.60	972.67
child's income	5015	0.36	0.53
predicted child's income	5015	0.36	0.24
parents' income	5015	2.06	1.84
transfer receipt dummy	3287	0.57	0.49
transfer amount	1886	2871.70	2713.53
years of post-secondary schooling	2337	3.67	1.83
initial program choice: 2-yr vs. 4-yr	2936	0.70	0.46

Table A4: Probit for Selection Correction of Predicting Equations

	enrollment		
Explanatory Variables	**coefficient**		**χ^2**
intercept	-3.56595	***	39.15
parents' income	0.06272	***	15.98
standardized test score	0.01187	***	90.89
standardized high school GPA	0.96873	***	345.86
gender dummy (1 = male)	-0.00874		0.02
Hispanic dummy	0.17806	**	4.95
Native American dummy	-0.04116		0.04
Asian/Pacific Islander dummy	0.77057	***	13.71
African American dummy	0.65908	***	35.25
number of siblings	-0.13075	***	34.41
number of older siblings	0.06623	***	9.48
traditional family dummy	0.14411	**	6.36
number of rooms in home	0.04865	***	11.05
parents' highest education dummies:			
high school graduate	0.08624		0.63
less than 2 years vocational school	0.19714	**	5.29
2+ years vocational school	0.42725	***	23.44
less than 2 years college	0.36830	***	18.57
2 or more years college	0.67984	***	69.11
4 or 5 year college degree	0.83393	***	64.30
master's degree	0.53538	***	20.24
(654 school dummies not reported)			
Log-Likelihood	-2096		
No. Observations	5015		

*** indicates significance at 1% level

** indicates significance at 5% level

* indicates significance at 10% level